Alpha Magnetic Spectrometer
NASA / DOE

Alpha Magnetic Spectrometer
Weekly Reports

September 24, 2004

National Aeronautics and
Space Administration

Upcoming Events:

- Meeting to discuss CITE Maintenance Costs and the AMS-02 Avionics Functional Interface Test (FIT) - TBD (due to Hurricane Jeanne) – KSC
- AMS General Technical Interchange Meeting (TIM) - October 20 - 22, 2004 – JSC
- Electronics TIM and Uninterruptible Power Supply (UPS) CDR - November 1-5, 2004 – Taiwan
- STA Vacuum Case Delivery (on dock at STADCO) - November 30, 2004
- Flight Vacuum Case Delivery (on dock at STADCO) - December 15, 2004
- Thermal Control System (TCS) Delta Critical Design Review (ΔCDR) - January, 2004 – JSC
- AMS General TIM - January 10 - 14, 2005 – KSC
- Tracker Thermal Control System (TTCS) PDR - January 2005, CDR - April 2005
- AMS-02 Phase II Safety Review - March 2005 - JSC

Upcoming Tests:

- AMS-02 Avionics Functional Interface Test (FIT) - January 2005 – KSC
- O-Ring Test Fixture (OTF) Vacuum Test - Suspended - J13
- Interface Plate Static Test - Date TBD - Location TBD
- Lower Joint Static Test - Date TBD - Location TBD
- STA Acoustic Test - Date TBD - ESTEC - Noordwijk, Netherlands (Schedule under review)
- STA Sine Sweep Test - Date TBD - INFN - Terni, Italy (Schedule under review)
- Full Assembly Modal & Static Tests - Date TBD - IABG - Munich, Germany

Status:

- The LMSO Alpha Magnetic Spectrometer (AMS) Project Manager and the AMS Thermal Analyst participated in a Thermal/Mechanical Workshop in Milan, Italy to status the AMS-02 Thermal Control System (TCS) design activity. The workshop was to be a precursor to the Thermal Control System (TCS) Delta Critical Design Review (ΔCDR) originally planned to be held in conjunction with the AMS General

Technical Interchange Meeting (TIM) scheduled for the week of October 18, 2004 in Houston. Based on discussions at the workshop and the lack of maturity of two major subsystem designs, the TCS ΔCDR will be rescheduled. Instead, it will be recommended that the General TIM be extended to the entire week, with the first two days set aside for sub-detector meetings. In addition, there will be TCS splinter meetings all day on October 18 & 19. If the TCS issues are not resolved at the October TIM, then another Thermal/Mechanical Workshop will be conducted six weeks later. At this point, it is assumed that the ΔCDR will be conducted in conjunction with the January AMS TIM.

- The LMSO AMS Project Manager traveled to Winterthur, Switzerland for discussions with representatives of Eidgenössische Technische Hochschule (ETH) - Zürich, Space Cryomagnetics Limited (SCL), and Hans Bieri Engineering (HBE) on the status of the Superfluid Helium (SFHe) Tank manufacturing activity. HBE has delayed the delivery of the lower half of the STA SFHe tank from the end of October until the end of November. Even with the one-month slip this is a very ambitious schedule based on the current status of fabrication and welding. HBE was put on notice that further delays are not acceptable. ETH is doing everything in their power to facilitate the manufacturing process, but is unlikely to be able to contribute further financial resources to solve the schedule problems. The STA tank will be complete by March 15, 2005 and the flight tank by July 2005. An integrated schedule has still not been developed, but ETH promised one by the October TIM. The Central Ring weld looks good, but HBE still has not completed the outer weld. It is currently taking four days to complete a pass on both sides of the weld. HBE recommended not fully completing the weld, but instead manually finishing the weld only at the places where the spokes connect to the outer ring. The LMSO welding authority must approve this, or the proposal will be vetoed. On a positive note, dramatic improvements have been made to HBE's quality records system.

- LMSO AMS personnel visited the Boeing's Houston Product Support Center (HPSC) to view the ACASS (Active Cargo Attachment System Simulator), including the Active Umbilical Mechanism Assembly (UMA) simulator. The Active UMA portion of the ACASS will be used during the Functional Integration Test (FIT) scheduled for January 2005 at KSC and will provide the connections to the ISS power and data simulators. The ACASS is scheduled for turnover to KSC in late October. Numerous questions were answered during the meeting, including questions regarding the Mil Std 1553 Stub lengths. Details on test data and results have been requested from Boeing.

- The design for the AMS Open Paper Management Tool (OPMT) was completed and the system implemented. The tool was created in Excel and converted to an Access database. Actions from the CDR, Document Review, and Configuration Control Board (CCB) have been input into the tool. A number of report formats have been created that provide outputs in Excel to permit access by the greatest number of users. An Excel-format OPMT - Open Actions Report is being posted to the EA AMS-02 Website for all team members to access. The objective for future work on the OPMT is to create an interactive web page so that individual team members can update their assigned action items on-line.

- Additional information was requested from STADCO on the out-of-tolerance flatness for the Structural Test Article (STA) Upper Support Ring. Once the information is received, an analysis will be run to determine the assembly stresses caused by the flatness out-of-tolerance condition. If the stresses are too high, additional machining work will be required to bring the ring to within the specified tolerance.

- Three Non-Conformance Reports (NCRs) were received on one Conical Flange. Dispositions for each of

the NCRs are in work. It remains to be determined if this Conical Flange can be used "as-is".

- Updates to the AMS-02 Experiment to Payload Integration Hardware (PIH) Interface Control Document (ICD) were completed and the document was submitted to the AMS Project Management Office for review.

- USS-02 Assembly Fixture fabrication activities are continuing in Bldg. 10 by Rothe Joint Venture (RJV). Materials for the Primary Support Stand (PSS) have been ordered. Fabrication will be initiated as soon as the materials are received.

- Two AMS-02 Passive Payload Attach System (PAS) component drawings (Bridge Shims & Shim Washers) were submitted to the LMSO shop for fabrication. When the parts are completed the PAS Assembly will be configured per the current revision of the assembly drawing and all outstanding paperwork will be closed.

- As a follow-up to this item reported last week: "The AMS Design Lead participated in a series of meetings at the European Center for Nuclear Research (CERN) to develop the Integration Plan and the Integrated Assembly Schedule for the AMS-02 Payload": The team consolidated the individual detector integration plans into a single document, additional assembly steps were added as required, and an estimated time was allotted for the performance of each task. In this draft document, the steps required and time estimates are rough and mostly high-level. Further consultation with each detector group is required to refine the document into a fully-detailed integration procedure.

- Vacuum Case Milestones

Contract Deliverable	Due Date	Status
First Article Conical Flange Complete	July 2004	(Machining complete, metal finish in work)
Weld Fixture Complete	August 2004	(Currently in use for rolled ring weld tests)
STA Support Rings Complete	September 2004	(Machining complete, metal finish in work)
Weld Development Complete	September 2004	(Flat plate qualification test in work)
STA Conical Flanges Complete	September 2004	(Machining complete, metal finish in work)
Flight Support Rings Complete	October 2004	
First Article Weld Complete	October 2004	
Flight Conical Flanges Complete	October 2004	
Shipping Fixture Complete	October 2004	(CDR complete)
STA Line Drill Operations Complete	October 2004	
STA Match Drill Procedure Complete	October 2004	
STA Weld Complete (for proof test @ STADCO)	November 2004	
STA Vacuum Case Delivery (on dock at STADCO)	November 30, 2004	
Flight Vacuum Case Delivery (on dock at STADCO)	December 15, 2004	